APHIS Factsheet
Plant Protection and Quarantine May 2006

Questions and Answers: EPA's Risk Assessment on Malathion

Q. What is malathion and how is it used?
A. Malathion is a commonly used organophosphate insecticide. In an agricultural setting, malathion is used to eliminate pests, such as boll weevils and fruit flies, that threaten the productivity of important crops like cotton and citrus. Human exposure is minimized in agricultural programs by targeting host crops or plants, and, in some programs, by using bait formulations with low malathion concentrations. For example, the cooperative boll weevil eradication program uses careful precision to apply malathion only to infested cotton fields. Because of application techniques and the rural location of most cotton fields, the risk of human exposure is low.

In an urban setting, malathion is used to control mosquitoes that can carry West Nile virus and other diseases of public health importance. It is also used as an insecticide to control pests in homes and personal gardens. Malathion is approved by the U.S. Food and Drug Administration as a prescription drug for the treatment of head lice on humans.

Q. What document is the Environmental Protection Agency releasing?
A. The Environmental Protection Agency (EPA) is undertaking an extensive reregistration effort involving hundreds of pesticides, including malathion, to ensure that they meet the requirements of the Food Quality Protection Act of 1996. As part of its review, in September 2005, EPA released a revised risk assessment on malathion for public comment.

EPA currently classifies malathion as having "suggestive evidence of carcinogenicity, but the evidence is not sufficient to assess human carcinogenic potential."

Q. So, does this mean malathion causes cancer?
A. According to EPA's document, studies conducted on rats and mice "showed tumors only at very high dose levels [of malathion] or that the number of tumors was so low that they could have occurred by chance rather than as a result of exposure to malathion. In addition, studies showed that malathion did not act as a mutagen to cause cancer." EPA states that, "Human exposures to malathion are generally quite low." Because potential human exposure is several orders of magnitude lower than dose levels in animal studies and the studies show no firm evidence of cancer caused by malathion, EPA concluded that when malathion is used according to label directions cancer risk is not a concern.

Q. What are the ecological effects of malathion?
A. EPA's document acknowledges that malathion degrades rapidly in the environment and does not pose a risk to birds. However, EPA does note that malathion is toxic to beneficial insects, and some concerns exist about malathion's effects on aquatic animals.

In addition, malathion, if left on hard, dry surfaces (e.g., swingsets, backyard toys, and decks) or in chlorinated water, can result in an increase in malaoxon levels. Malaoxon is a degradation product of malathion under certain conditions. Studies are being done to determine the environmental impact of malaoxon under such conditions. The EPA has recently suggested that malaoxon, previously viewed as a low-level contaminant of malathion, may be up to 77 times as toxic as malathion. However, the high purity of the malathion used in boll weevil eradication (typically 97- to 99-percent pure malathion) means that the amount of malaoxon, and any human health risk associated with such treatments, is negligible.

Comprehensive risk assessments that evaluate the way malathion is used in the U.S. Department of Agriculture's Animal and Plant Health Inspection Services' (APHIS) cooperative programs indicate little to no effects on nontarget organisms. Years of environmental monitoring conducted in conjunction with APHIS' programs confirm that if ecological effects occur, they are minimal, limited in duration, and confined to treatment areas.

Q. Does this assessment place new restrictions on the use of malathion?
A. This revised risk assessment will be considered by EPA as it develops any risk mitigation measures that it considers necessary. Thus far, the assessment has not resulted in new restrictions on the agricultural uses of malathion. However, the assessment is subject to review, comment, and further revision.

Q. Does EPA's revised risk assessment change any of APHIS' programs that are currently underway?
A. APHIS has announced no changes to programs that are currently underway.

EPA expressed concern about the potential risk from malaoxon to toddlers near cotton fields, and in chlorinated drinking water near citrus production areas. However, the high purity of malathion used in boll weevil eradication (typically 97- to 99-percent pure malathion) means that the amount of malaoxon, and any human health risk associated with such treatment is negligible.

APHIS is working closely with EPA to further refine the risk assessment.

Q. How does this affect APHIS programs in the future?

A. To comply with existing laws, APHIS prepares environmental documentation that analyzes the potential impacts of its programs. The environmental documentation considers alternative courses of action and ensures that APHIS is using the most efficacious means to protect U.S. agriculture, while remaining sensitive to human health and other ecological concerns.

APHIS is considering the implications of EPA's revised risk assessment. Upon publication of EPA's final risk assessment, APHIS will consider the need to revise the environmental documentation for programs that use malathion.

Q. Who can I contact for more information?

A. For additional information regarding malathion and the boll weevil eradication program, please call APHIS' Environmental Monitoring staff in Riverdale, MD, at (301) 734–8247.
